modulus of torsion in different woods, which he finds to vary from about 9000 to 30,000 pounds, and to follow nearly the order of the specific gravity. In the metals, the modulus of torsion is one sixteenth of the modulus of elasticity.

On a Differential Barometer. *By the late* William Hyde Wollaston, *M.D. F.R.S.* *Communicated by* Henry Warburton, *Esq. F.R.S.* Read February 5, 1829. [*Phil. Trans.* 1829, *p.* 133.]

The instrument described in this paper is capable of measuring with considerable accuracy extremely small differences of barometric pressure. It was originally contrived with the view of determining the force of ascent of heated air in chimneys of different kinds; but as its construction admits of any assignable degree of sensibility being given to it, it is susceptible of application to many other purposes of more extensive utility. A glass tube, of which the internal diameter is at least a quarter of an inch, being bent in the middle into the form of an inverted siphon, with the legs parallel to each other, is cemented at each of its open extremities into the bottom of a separate cistern about two inches in diameter. One of these cisterns is closed on all sides, excepting where a small horizontal pipe opens from it laterally at its upper part; while the other cistern remains open. The lower portion of the glass tube is filled with water, or other fluid, to the height of two or three inches; while the remaining parts of the tube, together with the cistern, to the depth of about half an inch, are filled with oil; care being taken to bring the surfaces of water in both legs to the same level, by equalizing the pressures of the incumbent columns of oil. If the horizontal pipe be applied to the key-hole of a door, or any similar perforation in a partition, between portions of the atmosphere in which the pressures are unequal, the fluid in the corresponding half of the instrument will be depressed, while it is raised in the opposite one, until the excess of weight in the column thus elevated will just balance the external force resulting from the inequality of atmospheric pressures upon the surfaces of oil in both cisterns. This excess, however, is equal only to the difference between the weight of the column of water pressing on one side, and that of an equal column of oil which occupies the same length of tube on the other side. This difference depending upon the relative specific gravities of the two fluids will, in the case of olive oil and water, be about one eleventh of the weight of the column of water elevated; but the sensibility of the instrument might be increased at pleasure, by mixing with the water a greater or less quantity of alcohol, by which the excess of its specific gravity over that of oil may be reduced to one twentieth, one thirtieth, or any other assignable proportion. The instrument may be converted into an anemometer by closing both the cisterns, and by applying to the upper part of each a trumpet-mouthed aperture opening laterally.